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John C. Thompson
69 Grayton Road
Tonawanda, NY 14150

EXAMINER

LAMB, BRENDA A

ART UNIT

PAPER NUMBER

1734

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/071,143

Applicant(s)

RHEINBERGER ET AL.

Examiner

Brenda A. Lamb

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2005 and 17 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5 and 7-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5 and 7-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/17/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 7-9 and 12-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, 5, 7-16 are confusing since applicant fails to relate the base upon which layers of synthetic material are applied upon or the synthetic material part to the dental restorative part being produced as recited in the preamble of the claims.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 1, 8, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Uchinono et al, WO 01/13814 (Feenstra) and Brodtkin et al in view of GB 2 350 321 (Speakman).

Uchinono et al teaches a method for producing a synthetic material by spraying using a spray coating apparatus. Uchinono et al method is comprised of: spray applying with a spray device a material having a polymerizable synthetic material onto a base in succeeding layers such that each layer of the spray applied material is polymerized by a light source, wherein material includes a wax-like substance having a viscosity such that run off of the just applied spray drops used for the layer building is prevented while on the other hand the viscosity value is so small that it is possible to perform a penetration of the spray jet in a favorable manner; hardening at least one already applied layer prior to the application of subsequent layers. See Uchinono et al's second embodiment and eight embodiment. Uchinono et al also teaches in the eight embodiment that each of the layers of the synthetic material part other than the bottommost and topmost layer is polymerized to a degree which is less than complete throughout the given layer yet supports the retention of the next layer applied thereon. Uchinono et al fails to teach the light source is mounted on the nozzle. Uchinono et al fails to his process produces a synthetic dental restorative. However, it would have been prima facie obvious to manufacture a variety of articles having complex shapes such as dental restorative part using the Uchinono et al process for building complex three-dimensional objects by providing successive layers onto each other especially since WO 01/13814 (Feenstra) and Brodtkin et al

each teach
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producing dental restorative parts by providing successive layers onto each other. Uchinono et al also fails to teach the light source is mounted on the nozzle. However, given the combined teaching of Uchinono et al, WO 01/13814 (Feenstra) and Brodtkin et al, it would have been obvious to mount Uchinono et al light source on its nozzle since Speakman teaches a light source integrated/mounted on a print head (see abstract of Speakman and Figures 7-8, 10-12 and 15-16). With respect to claim 13, Uchinono et al teaches in the eight embodiment that the outermost or top layer and first or bottom most layer have the same material composition. With respect to claim 14, Uchinono et al teaches in the second and eight embodiments the step of spraying and the step of hardening results in the formation of a three dimensional objects from a three dimensional printing process. With respect to claim 8, Uchinono et al teaches in alternate embodiment thermally treating or heating the last applied unpolymerized layer after hardening step of the previous layer of the synthetic material part in order to facilitate smoothening the last applied unpolymerized layer (see Uchinono et al fourth embodiment). Therefore, it would have been obvious to modify the Uchinono et al process by providing a step of thermally treating the last applied unpolymerized layer after hardening step of the previously applied of the synthetic material part by providing a heating means for the taught advantage ^{to} facilitate the smoothing step.

Claims 1, 10, 13-14 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Jang et al 2002/0093115, WO 01/13814 (Feenstra) and Brodtkin et al in view of GB 2 350 321 (Speakman),.

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Jang et al teaches a method for producing a synthetic material comprising: spray applying with a spray device a material having a polymerizable synthetic material onto a base in succeeding layers such that each layer of the spray applied material is polymerized by a light source, wherein material includes a wax-like substance or a substance having a viscosity such that run off of the just applied spray drops used for the layer building is prevented while on the other hand the viscosity value is so small that it is possible to perform a penetration of the spray jet in a favorable manner; hardening at least one already applied layer prior to the application of subsequent layers wherein each layer is polymerized prior to the application thereto of the next layer to a polymerized condition which is less than complete polymerization yet is such that the layer supports the retention of the next layer applied thereon. Jiang et al fails to teach the light source is mounted on the nozzle. Jiang et al also fails to ^{teach} his process produces a synthetic dental restorative. However, it would have been prima facie obvious to manufacture a variety of articles having complex shapes such as dental restorative part by using the Jiang et al process for building complex three-dimensional objects by providing successive layers onto each other especially since WO 01/13814 (Feenstra) and Brodtkin et al each teach producing dental restorative parts by providing successive layers onto each other. Jiang et al also fails to teach the light source is mounted on the nozzle. However, it would have been obvious given the combined teaching of Jiang et al, WO 01/13814 (Feenstra) and Brodtkin et al to mount Jiang et al light source on its nozzle since Speakman teaches a light source integrated/mounted on a print head (see

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abstract of Speakman and Figures 7-8, 10-12 and 15-16). With respect to claim 17, the same rejection applied to claim 1 is applied. Speakman teaches optically shielding the nozzle outlet using a shutter during exposure of the substrate to a light source (see Figure 13 and claims 23 and 25). Therefore, given the combined teaching of Jiang et al, WO 01/13814 (Feenstra) and Brodtkin et al and Speakman with Jiang et al light source mounted on the print head to optically shield the spray jets during exposure to a light source, UV, since Speakman teaches doing so using a shutter to prevent pluggage of the spray nozzles. With respect to claim 18, Speakman shows in Figure 13 that the light shield or shutter is arranged between the spray jets and the light source. Although Speakman fails to teach whether or not the shutter is soft but obvious to construct the shutter from a soft or flexible material to avoid damage by scratching the tip portion of the spray jets. With respect to claim 13, Jiang et al is silent as to the layers of the completed synthetic part being different and thereby reads on the outermost layer formed of the same materials as the first layer. With respect to claim 14, Jiang et al teaches the step of spraying and the step of hardening results in the formation of a three dimensional objects from a spray nozzle assembly for applying the polymerizable material in a pattern onto the layer of powder thereby reading on printing (see Jiang et al paragraph 0126). With respect to claim 10, Brodtkin et al teaches the use of a color imparting material in the building of a dental restorative implant (see Brodtkin et al at column 5 line 58 to column 6 line 10). Therefore, given the combined teaching of Jiang et al, WO 01/13814 (Feenstra), Brodtkin et al and Speakman, it would have been obvious to include

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colored pigments in the layer of powder as well as the polymerizable material applied by the spray nozzle in order to provide desired coloring to the synthetic part as built *as taught by Brodtkin et al*

Claims 7, 9, 12 and 11 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 5 and 15-16 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to Brenda A. Lamb at telephone number (571) 272-1231. The examiner can normally be reached on Monday and Wednesday thru Friday with alternate Tuesdays off.

Brenda A. Lamb
Brenda A Lamb
Examiner
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